

AMENDMENTS TO THE CLAIMS

Please amend Claims 1 and 8; and add new Claims 15-20 as follows.

LISTING OF CLAIMS

1. (currently amended) A fluid heating apparatus comprising:
 - a pump for circulating fluid through a fluid passage;
 - a heating device for heating the fluid;
 - first temperature detecting means for detecting temperature at a first position of the fluid passage which is located adjacent the heating device and is heated by the heating device;
 - second temperature detecting means for detecting a temperature at a second position of the fluid passage which is spaced from the heating device on a downstream side of the heating device and is thermally isolated from the heating device more than the first temperature detecting means;
 - ~~control means for controlling the heating device wherein when a temperature difference between the temperature detected by the first temperature detecting means and the temperature detected by the second temperature detecting means exceeds a predetermined level~~ higher than the temperature detected by the second temperature detecting means, the control means stops heating operation of the heating device.
2. (original) The fluid heating apparatus according to claim 1, wherein the first temperature detecting means detects a temperature of a pipe forming the fluid passage.

3. (original) The fluid heating apparatus according to claim 1, wherein the first temperature detecting means detects a temperature proximate to a pipe forming the fluid passage.

4. (original) The fluid heating apparatus according to claim 1, wherein the heating device heats a portion of a pipe, which forms the fluid passage, wherein the first temperature detecting means detects a temperature at a position proximate to a downstream portion of the heated portion of the pipe.

5. (original) The fluid heating apparatus according to claim 1, wherein the first temperature detecting means is disposed at a position proximate to an upper half of the heating device.

6. (original) The fluid heating apparatus according to claim 1, wherein a portion of the fluid passage that is heated by the heating device includes a curved portion, wherein the first temperature detecting means is disposed proximate to the curved portion.

7. (original) The fluid heating apparatus according to claim 6, wherein the first temperature detecting means is disposed proximate to an apex of the curved portion.

8. (currently amended) A heating apparatus for heating air comprising:

- a pump for circulating fluid;
- a heating device for heating the fluid;
- a heat exchanger for performing heat exchange between the air and the fluid heated by the heating device, the heat exchanger being spaced from the heating device on a downstream side of the heating device;
- a first sensor for detecting a temperature of the fluid around the heating device; and
- a second sensor for detecting a temperature of the fluid at a position which is spaced from the heating device on the downstream side of the heating device and which is proximate to a fluid inlet of the heat exchanger; and

control means for controlling the heating device wherein when a ~~temperature difference between~~ the temperature detected by the first sensor ~~[[and]]~~ is greater than the temperature detected by the second sensor ~~is greater than~~ by a predetermined level, the control means stops heating operation of the heating device.

9. (original) The heating apparatus according to claim 8, further comprising:

- a target temperature determining means for determining a target temperature of the fluid flowing into the heat exchanger; and
- a controlling means for controlling operation of the heating device such that the detected temperature of the second sensor reaches the target temperature.

10. (previously presented) The heating apparatus according to claim 8, wherein the heating device heats a portion of a fluid passage through which the fluid is circulated, wherein the first sensor detects a temperature proximate to a downstream portion of the heated portion of the fluid passage.

11. (previously presented) The heating apparatus according to claim 8, wherein a portion of a fluid passage through which the fluid is circulated is heated by the heating device and has a curved portion and the first sensor detects a temperature proximate to an apex of the curved portion.

12. (previously presented) The fluid heating apparatus according to claim 1, wherein the fluid heating apparatus is for a vehicular air conditioner.

13. (previously presented) The fluid heating apparatus according to claim 1, wherein:

the first temperature detecting means indirectly detects the temperature of the fluid in the fluid passage through a wall of the fluid passage at the first position of the fluid passage; and

the second temperature detecting means indirectly detects the temperature of the fluid in the fluid passage through the wall of the fluid passage at the second position of the fluid passage.

14. (previously presented) The heating apparatus according to claim 8, wherein:

the heating apparatus is for a vehicular air condition; and

the heat exchanger performs heat exchange between the fluid heated by the heating device and air to be blown into a passenger compartment of a vehicle.

15. (new) A heating apparatus for heating fluid circulated by a pump, the fluid being supplied to a heat exchanger for heating air by the fluid, the apparatus comprising:

a heating device for heating the fluid, the heating device being located upstream in a fluid passage with respect to the heat exchanger;

a heat fluid sensor located on a fluid downstream side to the heating device, the heat fluid sensor being responsive to a temperature of the fluid heated by the heating device and supplied to the heat exchanger;

a heat protect sensor located on a position closer to the heating device than that of the heat fluid sensor, the heat protect sensor being responsive to a temperature directly reflecting heat generation of the heating device;

a controller which performs as a heating rate controller and a protective controller, wherein

the heating rate controller controls a rate of power supply to the heating device in response to the heat fluid sensor so that the heat exchanger is supplied with the fluid heated by the heating device in a predetermined level, and

the protective controller interrupts power supply to the heating device in response to both the heat fluid sensor and the heat protect sensor, the protective controller interrupts the power supply when the temperature detected by the heat protect sensor exceeds the temperature detected by the heat fluid sensor by a predetermined temperature.

16. (new) The heating apparatus according to claim 15, wherein the heating rate controller controls the rate only when the protective controller enables the power supply to the heating device.

17. (new) The heating apparatus according to claim 16, wherein the protective controller interrupts power supply to the heating device when the pump is not operated.

18. (new) The heating apparatus according to claim 16, wherein the protective controller interrupts power supply to the heating device when the pump is not operated.

19. (new) The heating apparatus according to claim 15, wherein
the heat fluid sensor is located on a fluid inlet of the heat exchanger, and
the heat protect sensor is disposed on a pipe in which the fluid flows, the heat protect sensor being located on a position just downstream of a heated portion where the pipe and the heating device are thermally coupled.

20. (new) The heating apparatus according to claim 15, wherein
the heat fluid sensor is located on a fluid inlet of the heat exchanger, and
the heat protect sensor is disposed on a member which covers a pipe in
which the fluid flows and the heating device.